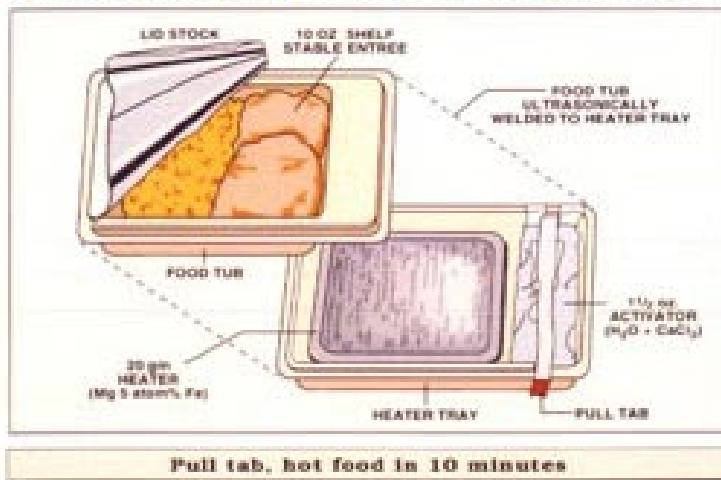


Technology Transfer Success Stories

HeaterMeals

developed by
NATICK Research, Development & Engineering Center

SELF HEATING INDIVIDUAL RATION



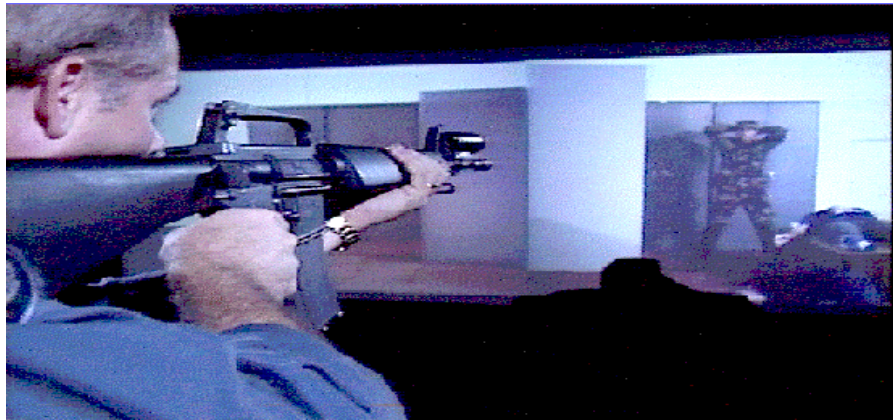
Artist's rendering of the Self Heating Individual Ration, showing how the food tub fits into the heater tray to be heated. This military technology has been successfully transferred to industry and is now commercially marketed for use by truckers, construction workers, hunters, fishers, and campers.

- In 1995, ZestoTherm, a manufacturer of chemical heating devices, and Land'Frost, a co-packer of shelf stable tray foods, commercially marketed HeaterMeals.
- HeaterMeals, a first of its kind self-heating meal designed to provide the capability for a hot, alternative, retail market,.
- The success of HeaterMeals has helped to stabilize the military ration production base during periods of downsizing, as both companies can now rely less on military business for their own financial well being.
- The technology may have future military application when a self-heating meal is approved for use in operational rations.

Timely sharing of military self-heating meal technology with commercial industry partners.

Weapons Team Engagement Trainer

developed by
Naval Air Warfare Center Training Systems Division



NAWCTSD and Firearms Training Systems, Inc., are working directly with potential military and law enforcement organizations to develop a commercial version of the system.

- NAWCTSD has developed the Weapons Team Engagement Trainer (WTET) prototype to improve the realism and increase the effectiveness of Special Weapons and Tactics (SWAT) team training. This system provides realistic tactical engagements for team members of military special forces, SWAT teams and other law enforcement personnel in Hostage rescue, Terrorist confrontations, Ambush response, and Close-quarter combat .
- The WTET: Links large screen, video production and digital audio technology, infrared location sensors, and multiple scenarios into a realistic, multi-room training experience; Wirelessly tracks each team member's position and vulnerability to hostile fire, requiring tactical movement; provides realistic aggressor response, branching and shoot back with scored hits on trainees; continuously tracks and records all trainee's weapon aim points and results of shots fired; allows reconfiguration of training rooms to represent different buildings, aircraft, etc.; provides instructor controlled, full scenario playback of trainee actions, and weapon aimed point tracking and performance review; has been demonstrated extensively to the military and law enforcement communities.

Shoulder-Launched Multipurpose Assault Weapon (SMAW) CRADA



Objective:

Develop an improved SMAW system

Responsibilities:

NSWC Dahlgren

Design/Development

Technical advice

**Support operational
evaluation**

CMS

Fabrication

Testing

**Production
Marketing**

Achievements:

USMC

Improved launcher completed

DT Testing completed

NSWC Dahlgren

License fees

CMS

Weapon system for domestic/international markets

U.S. Economy

Majority U.S. manufacturing

Foreign sales

Benefits:

23% lower cost / 15% lighter weight

Improved Durability / Maintainability

Environmentally sealed rocket firing mechanism

Standard / removable rifle firing mechanism

**Combination NATO standard/original SMAW
sight bracket**

Range adjustment on iron sights

Clear side for ease of carry

Chemiluminescent Systems

developed by
Naval Air Warfare Center Weapons Division, China Lake



Current DoD usage:

15 million units/year

Commercial uses in:

safety
police work
recreational novelties
emergency safety lights
deep-sea fishing

- Non-fire-producing chemical compounds - 2 liquids stored separately & luminesce instantly when mixed
- Long-lasting luminous intensity - intensity & duration of light emission can be varied by catalysis/color can be varied
- Efficiency in extreme temperature conditions
- Primary uses in the Navy include:
 - emergency lights
 - man-overboard float lights
 - target marking
 - covert night-vision radiation source
 - underway ship-to-ship replenishment
 - helicopter landing zone marking
 - night parachute and paradrop operations
- The devices were widely used during Desert Storm for covert marking and signaling (light sticks were standard issue for every person in the Gulf War).

TraceAir™

developed by
Naval Air Warfare Center Weapons Division, China Lake

TraceAir™ - New Instrument for Monitoring Slack Metals



- Thermo Jarrell Ash introduces TraceAir, the first continuous air monitor (CAM) of its kind for the real time determination of metals present in stack gases being emitted from boilers, incinerators and furnaces.
- Developed jointly with the U.S. Navy under a CRADA, the instrument isokinetically extracts simple air from a hot stack and transports it to the analyzer through a heated transfer line.
- The entire sample is analyzed for metals using a specially modified argon inductively coupled plasma (ICAP) with a multi-channel spectrometer.
- Metals in the stack gas are detected simultaneously and reported as micrograms per dry standard cubic meter ($\mu\text{g}/\text{dscm}$).

Comanche Helicopter Antenna Performance

CRADA # 98-259-IF-01

Air Force Research Laboratory/IF

OBJECTIVE: The purpose of this Agreement was to interface with the Boeing engineering personnel on possible changes to the Comanche airframe that could affect future antenna performance tests at AFRL/IF, and to exhibit AFRL/IF testing capability to Boeing senior management at a Boeing in-house family day.



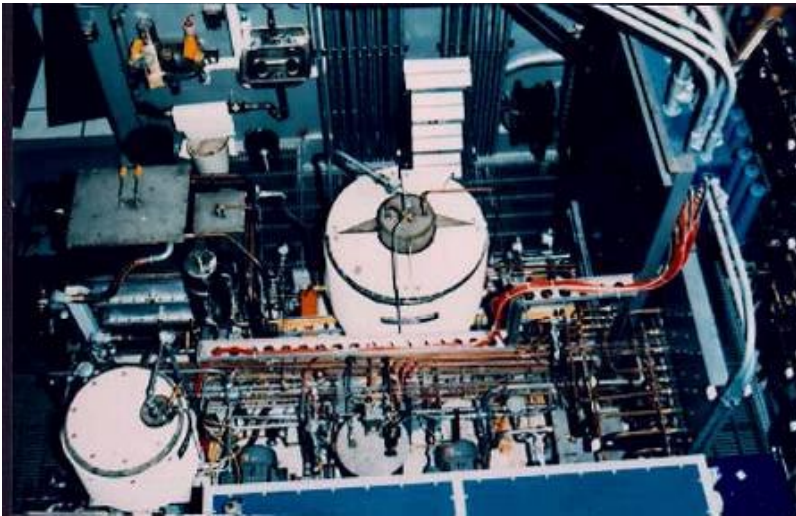
- **BENEFITS:**
 - **AIR FORCE:** Provided feedback from Boeing engineers on airframe changes that AFRL was unaware of which could affect future measurement programs using the RAH-66 Comanche at Rome Research Site.
 - **PARTNER:** One of Boeing's major program airframes displayed for their open house and allowed Boeing engineers the opportunity to interface with AFRL personnel on suggested communication antenna placements on the airframe.
- **INFORMATION:** AFRL/IF engineers arranged for the Full Scale Comanche helicopter to be packed and shipped to, and re-assembled and returned from the Boeing facility in Philadelphia, PA. Boeing paid for all shipping cost and AFRL/IF travel and manpower costs for the CRADA.

Use of Drag Reducing Agent (DRA) in Jet Fuel

CRADA # 98-173-PR-01

Air Force Research Laboratory/PROP

OBJECTIVE: The objective of this CRADA is to conduct testing to demonstrate the compatibility of DRA in aviation turbine fuel (JP-8). At the completion of the work program, the US Air Force will analyze the test data and formulate a position statement with regard to the use of DRA in JP-8.



USAF Advanced Reduced Scale Fuel System Simulator

BENEFITS:

- **AIR FORCE:** The test program will produce technical information upon which the AFRL and the other governing bodies for commercial and other military fuel specifications can make informed decisions regarding the use of DRA. The use of DRA in jet fuel is the least expensive approach for achieving the required throughput to meet the increased demand for jet fuel by commercial airlines and the military.
- **PARTNER:** Approval of DRA will enable Buckeye Pipe Line Company, L.P. to use DRA in jet fuel to achieve required throughput, thus negating the need for additional pipeline construction or alternative transportation modes, either of which would increase the price of jet fuel.

INFORMATION: DRA is a fuel additive designed to reduce drag at the liquid/wall interface in a pipeline allowing greater throughput of product at reduced power consumption. DRA is approved for use in gasoline and diesel fuel, but not approved for use in jet fuel. Projections for future jet fuel requirements indicate that the capacity of existing infrastructure is not sufficient to meet demand. The options available to remedy this situation include augmenting current fuel deliveries with alternate modes of transport, building new pipelines or using DRA. Of the three choices, DRA is by far the most cost effective for both consumer and supplier. Before DRA can be approved for use, its impact on critical fuel properties must be determined. During the past several years, the AFRL has developed a series of unique tests and related facilities to investigate the impact of JP-8+100 additives in jet fuel. These tests and facilities are uniquely suited to determine the acceptability of DRA in jet fuel. Buckeye Pipe Line Company, L. P. will provide the DRA and appropriate analytical characterization and will reimburse the AFRL for the direct costs of conducting the testing program.